IN THE SPECIFICATION:

Please replace paragraph number **[0004]** with the following rewritten paragraph:

[0004] A conventional core barrel assembly typically includes an outer barrel assembly, a core bit, and an inner barrel assembly. Generally, a conventional outer barrel assembly comprises one or more hollow cylindrical sections, or "subs," which are typically secured end-~~to~~-to-end by threads. Secured to a lower end of the outer barrel assembly is the core bit, which is adapted to cut a cylindrical core and to receive the core in a central opening, or throat. The opposing upper end of the outer barrel assembly is attached to the end of a drill string, which conventionally comprises a plurality of tubular sections that extend to the surface. Disposed within the outer barrel assembly, and configured to receive the core as the core traverses the throat of the core bit and to retain the core for subsequent transportation to the surface, is the inner barrel assembly.

Please replace paragraph number **[0030]** with the following rewritten paragraph:

[0030] It would be desirable to conduct sponge coring operations with a core barrel assembly greater than 30 ft in length - i.e., using a 60 ft, 90 ft, 120 ft, or other desired ~~extended~~ extended-length core barrel comprised of multiple 30 ft (or some other suitable length) sections of inner barrel - such as is routinely performed in conventional coring operations, as noted above. However, to present day, it has been thought impossible to conduct sponge coring operations with extended-length core barrels - i.e., one having a length greater than 30 feet - due to a number of technical difficulties. Specifically, frictional forces generated between a core and a sponge-lined inner barrel increase as a function of length of the sponge-lined inner barrel, and high frictional forces can adversely affect the mechanical integrity of the core, as well as cause damage to the sponge material. Thus, for sponge-lined inner barrels longer than the conventional 30 feet, it has been believed that, without significant improvements of the sponge material, extreme frictional forces would be generated between the sponge materials, such extreme frictional forces leading to core damage and structural failure of the sponge material. Also,

differential thermal expansion and resultant problems, as noted above, become more pronounced with increasing length of the core barrel assembly. Further, suitable methods and apparatus for performing sponge coring with extended-length core barrels are presently unavailable. For example, methods and apparatus for separately presaturating and subsequently interconnecting individual sections of inner tube were heretofore unknown.

Please replace paragraph number **[0035]** with the following rewritten paragraph:

[0035] The sponge liners may be provided in conventional 5 ft or 6 ft lengths which are stacked end-to-end within the inner barrel assembly, or within each section of inner tube making up the inner barrel assembly. In another embodiment of the present invention, however, a sponge liner is provided in a length substantially equivalent to the length of the inner barrel assembly, or substantially equivalent in length to the length of each inner tube section making up a ~~multi-~~ multi-section inner barrel assembly.

Please replace paragraph number **[0041]** with the following rewritten paragraph:

[0041] Another embodiment of the present invention comprises a ~~pressure-~~ pressure-compensated inner barrel assembly. The pressure compensation may be provided by a pressure compensation mechanism, a thermal compensation mechanism, or a combination thereof. The pressure compensation mechanism comprises a housing movable through the inner barrel assembly and providing a fluid seal therebetween. The housing further includes a pressure relief element configured to open and release presaturation fluid from the inner barrel assembly when the fluid pressure therein achieves a specified threshold.

Please replace paragraph number **[0043]** with the following rewritten paragraph:

[0043] A further embodiment of the invention comprises an inner barrel assembly made up of multiple, sponge-lined inner tube sections and providing a single continuous chamber for receiving a core sample. The multiple inner tube sections may be interconnected on the drilling rig floor and the single continuous chamber of the inner barrel assembly may then be filled with

presaturation fluid. In an alternative embodiment, the individual inner tube sections may be sealed and separately filled with presaturation fluid. The individual ~~pre-~~presaturated inner tube sections are then interconnected to form an inner barrel assembly having the single continuous chamber.

Please replace paragraph number **[0051]** with the following rewritten paragraph:

[0051] FIG. 3 is a cross-sectional view of the sponge liner as taken along line ~~III-III~~ 3-3 of FIG. 2;

Please replace paragraph number **[0076]** with the following rewritten paragraph:

[0076] In an alternative embodiment of the present invention, the inner barrel assembly 200, rather than being comprised of inner tube sections 210a, 210b, 210c and separate sponge liner or liners 240, is comprised of one or more sponge-lined inner tube sections, or integrated sponge barrels 280, as shown in FIG. 5. Each integrated sponge barrel 280 comprises an inner tube section 282 encasing an annular layer of sponge material 281. The inner tube section 282 may be constructed of any suitable material, including both ferrous and nonferrous metals as well as resin- or epoxy-based composite materials. The annular layer of sponge material 281 is secured to, or molded onto, the interior cylindrical surface 283 of the inner tube section 282. One or more grooves (not shown in FIG. 5) may be formed or machined into the interior cylindrical surface 283 of the inner tube section 282 to secure the annular layer of sponge material 281 thereto, as shown and described with respect to FIGS. 2 through 4. Also, as shown in ~~FIGS. 2 through 4~~ FIG. 5, the integrated sponge barrel 280 may include a layer of webbing 286 immersed in, or molded into, the annular layer of sponge material 281.

Please replace paragraph number **[0078]** with the following rewritten paragraph:

[0078] In a further embodiment of the invention, the inner tube sections 210a, 210b, 210c and the sleeve 242 of the sponge liner or liners 240 disposed therein are constructed of the same or similar materials. In this embodiment, the materials employed to construct the inner

tube sections 210a, 210b, 210c and the sleeves 242 are the same material or, alternatively, different materials having equivalent, or nearly equivalent, rates of thermal expansion. Therefore, through proper selection of the material or materials used to construct the inner tube sections 210a, 210b, 210c and the sleeve 242 of each sponge liner 240, differential thermal expansion between the inner tube sections 210a, 210b, 210c and the~~-sponger~~ sponge liner or liners 240 disposed therein, respectively, is substantially eliminated.

Please replace paragraph number **[0079]** with the following rewritten paragraph:

[0079] Referring to FIG. 6, a portion of a first sponge liner 240a is shown in an end-to-end relationship with a portion of a second sponge liner 240b. The end 290a of the first sponge liner 240a is in abutting contact with the end 290b of the second, adjacent sponge liner 240b. Sponge liner 240a comprises sleeve 242a, annular sponge layer 241a, and webbing layer 246a, while sponge liner 240b comprises sleeve 242b, annular sponge layer 241b, and webbing layer 246b. End 290a of the first sponge liner 240a is formed to a contour 291a and end 290b of the second sponge liner 240b is formed to a mating contour 291b. The contours~~-91a,~~ 291a, 291b are generally ~~non-~~nontransverse to the longitudinal axis 12 of sponge core barrel assembly 10 and are substantially conformal to one another, such that the ends 290a, 290b of the first and second sponge liners 240a, 240b, respectively, closely mate to form an interlocking end-to-end connection between the first and second sponge liners 240a, 240b. The contours 291a, 291b may be of any suitable configuration, such as, for example, a bevel as shown in FIG. 6, a generally parabolic contour, or a tongue-in-groove configuration.

Please replace paragraph number **[0127]** with the following rewritten paragraph:

[0127] For either of the core barrel assemblies shown and described with respect to FIGS. 1A-1C and 12A-12C, respectively, friction between the sponge-lined inner barrel assembly 200 and the core sample 5 may be significantly reduced by using one or more sponge liners 240 - or, optionally, one or more integrated sponge barrels 280 - according to the invention. Specifically (see FIG. 2), a layer of webbing material 246 may be molded into or

immersed within the sponge layer 241 of the sponge liner or liners 240, or a layer of webbing material 286 may be molded into or immersed within the sponge ~~layer~~ material 281 of the integrated sponge barrel or barrels 280. Reducing friction between the core sample 5 and inner barrel assembly 200 can protect against fracture of the core sample 5, thereby improving core integrity, especially for an extended-length inner barrel assembly 200 (i.e., one having a length greater than the conventional 30 feet).

Please replace paragraph number **[0133]** with the following rewritten paragraph:

[0133] An opposing lower surface 1048 of the thrust plate 1042 rests against a shoulder 340a provided on the interior wall of the core bit 300a to maintain the lower end of the inner barrel assembly 200 (i.e., the core shoe 220) at a desired longitudinal distance from the throat 320a of the core bit 300a. Also disposed on the interior wall of the core bit 300a are one or more latch ~~elements~~ mechanisms 350a. A latch ~~element~~ mechanism 350a is configured to allow passage thereby of the core shoe 220 and the lower end 212a of the lowermost inner tube section 210a during insertion of the inner barrel assembly 200 into the outer barrel assembly 100, and is further configured - in conjunction with the shoulder 340a - to maintain the inner barrel assembly 200 in the proper longitudinal position within the outer barrel assembly 100. The latch element 350a may be any suitable latching or locking mechanism known in the art capable of retaining the inner barrel assembly 200 in the proper longitudinal position.

Please replace paragraph number **[0134]** with the following rewritten paragraph:

[0134] By way of example, the latch ~~element~~ mechanism 350a may comprise a retractable latch 390, as shown in FIG. 13. The retractable latch 390 includes a pawl 395 resiliently biased radially inward toward the longitudinal axis 12 and configured to retract within a cavity 393 in the interior wall of the core bit 300a during passage thereby of the core shoe 220 and the lower end 212a of the lowermost inner tube section 210a. The retractable latch 390 further includes at least one register surface 397 configured to contact, or at least lie in close proximity to, an opposing upper surface 1049 of the bearing plate 1044. When the inner barrel

assembly 200 is fully inserted into the outer barrel assembly 100 and the lower surface 1048 of the thrust plate 1042 is abutting the shoulder 340a on the interior wall of the core bit 300a, the register surface 397 of the retractable latch 390 maintains the lower surface 1048 of the thrust plate 1042 in contact with, or at least in close proximity to, the shoulder 340a. Thus, the shoulder 340a, thrust bearing assembly 1040, and retractable latch 390 - as well as any latch ~~element~~ mechanism 350a - are cooperatively configured to maintain the inner barrel assembly 200 in a fixed vertical position relative to the outer barrel assembly 100 during coring.

Please replace paragraph number **[0162]** with the following rewritten paragraph:

[0162] In another embodiment of a method for performing sponge coring according to the invention, the inner tube sections 210a, 210b, 210c are directly interconnected (see FIGS. 12A-12C) on the rig floor to form an inner barrel assembly 200 having a single, continuous fluid chamber 205 for receiving presaturation fluid, and the ~~assembled~~ inner barrel assembly 200 is filled with presaturation fluid on the rig floor. In this embodiment, presaturation of the inner barrel assembly 200 may alternatively occur in a mouse hole. The presaturated inner barrel assembly 200 is then inserted into the outer barrel assembly 100, which is suspended through the floor of the drilling rig. Presaturation may also be done after the inner barrel assembly 200 is disposed in the outer barrel assembly 100.

Please replace paragraph number **[0165]** with the following rewritten paragraph:

[0165] In yet a further embodiment of the invention, make up of the sponge core barrel assembly 10 proceeds according to any of the embodiments set forth above; however, the conventional swivel assembly is eliminated and replaced with a near-bit swivel assembly 1000. The lowermost inner tube section 210a and core bit 300a are each configured to receive and cooperate with the near-bit swivel assembly 1000. During make up of the outer barrel assembly 100, the core bit 300a, having shoulder 340a and latch ~~element~~ mechanism 350a, is fitted with, for example, the bushing 1024 of a radial bearing assembly 1020. If other alternative bearing configurations are used, make up of the outer barrel assembly 100 may not include

insertion of a bearing assembly, or a portion thereof, into the core bit 300a. Similarly, the lower end 212a of the lowermost inner tube section 210a is fitted with, for example, the journal 1022 of a radial bearing assembly 1020 and a thrust bearing assembly 1040. Again, alternative bearing configurations may be employed.

Please replace paragraph number **[0166]** with the following rewritten paragraph:

[0166] When lowering the inner barrel assembly 200 into the outer barrel assembly 100, the latch ~~element~~ mechanism 350a disposed on the wall of the core bit 300a (or, alternatively, on the interior wall of the lowermost inner tube section 210a) will allow passage thereby of the core shoe 220 and the lower end 212a of lowermost inner tube section 210a. For example, if the latch ~~element or elements~~ mechanism or mechanisms 350a comprise a retractable latch 390, as shown in FIG. 13, the pawl 395 will retract within the mating cavity 393 to allow passage of the inner barrel assembly 200. Lowering of the inner barrel assembly 200 continues until the journal 1022 of radial bearing assembly 1020 is aligned with the mating bushing 1024 and the lower surface 1048 of the thrust plate 1042 of thrust bearing assembly 1040 abuts the shoulder 340a extending from the wall of the core bit 300a.

Please replace paragraph number **[0167]** with the following rewritten paragraph:

[0167] With the inner barrel assembly 200 fully lowered into the outer barrel assembly 100 and the lower surface 1048 of the thrust plate 1042 of thrust bearing assembly 1040 resting against the shoulder 340a, the latch ~~element~~ mechanism 350a and shoulder 340a cooperatively maintain the inner barrel assembly 200 in the proper longitudinal position and orientation along the longitudinal axis 12 of the core barrel assembly 10. For example, if the latch ~~element or elements~~ mechanism or mechanisms 350a comprise a retractable latch 390, at least one register surface 397 on the pawl 395 abuts, or is in close proximity to, the upper surface 1049 of the bearing plate 1044 of thrust bearing assembly 1040. Further, the radial bearing assembly 1020 maintains the proper radial position and orientation of the inner barrel assembly 200 relative to the outer barrel assembly 100.

Please replace paragraph number **[0169]** with the following rewritten paragraph:

[0169] With the inner barrel assembly 200, having the single continuous chamber 205, disposed within the outer barrel assembly 100 to form a sponge core barrel assembly 10, sponge coring operations can be conducted. The sponge core barrel assembly 10 is lowered to the bottom of the bore hole, the drill string attached to the upper end 120 of the outer barrel assembly 100 extending to the surface. The appropriate rotational speed, ROP, and weight-~~on~~ on-bit ("WOB") are selected based on the type of the core bit 300 being used, the size and operational characteristics of sponge core barrel assembly 10, and the formation characteristics.

Please replace paragraph number **[0172]** with the following rewritten paragraph:

[0172] Similarly, a gap 250b formed between the top end of the sponge liner 240 (or the top end of the uppermost sponge liner 240, if more than one) disposed in the intermediate inner tube section 210b and a shoulder 828 provided by the bottom end of the lower seal assembly 820 of valve assembly 800, as shown in FIGS. 1A-1C, 9, 10, and 11, or a shoulder 219c provided by the lower end 212c of the uppermost inner tube section 210c, as shown in ~~FIG.~~ FIGS. 12B-12C, will absorb any differential thermal expansion of the sponge liner or liners 240 disposed in the intermediate inner tube section 210b. One or more shims 50 may be disposed in the intermediate inner tube section 210b to take up any remainder of the gap 250b after full thermal expansion.

Please replace paragraph number **[0181]** with the following rewritten paragraph:

[0181] The many embodiments of a sponge core barrel assembly 10 according ~~the~~ to the present invention having been herein described, those of ordinary skill in the art will appreciate the many advantages thereof. A robust sponge liner 240 according to the invention includes a sleeve 242 having one or more grooves formed therein for creating a high-strength bond between the sleeve 242 and an annular sponge layer 241, thereby inhibiting debonding of the annular sponge layer 241 from the sleeve 242 during coring. The sponge liner 240 may

further include a layer of webbing 246 formed or molded into the annular sponge layer 241, adding additional structural strength to the annular sponge layer 241, preventing gouging of the annular sponge layer 241 by the core sample 5, inhibiting peeling of the annular sponge layer 241 from the sleeve 242, providing further mechanical support for the core sample 5 during transportation, and reducing friction between the core sample 5 and the annular sponge layer 241. Further, differential thermal expansion within the inner barrel assembly 200 may be eliminated by constructing the sleeve 242 of a sponge liner 240 and the inner tube sections 210a, 210b, 210c comprising the inner barrel assembly 200 from the same or similar materials. Also, differential thermal expansion can be eliminated using an integrated sponge barrel 280 according to the invention.